

REMARKS

The Examiner rejected Claim 14 under 35 U.S.C. § 102(b) as being anticipated by Patent Number 5,710,846 (Wayman). The Examiner rejected Claims 1, 6, and 7 under 35 U.S.C. § 103(a) as being unpatentable over Wayman in view of Patent Number 6,243,511 (Laughlin). The Examiner rejected Claims 2-5, 8, and 9-13 under 35 U.S.C. § 103(a) as being unpatentable over Wayman in view of Patent Number 6,243,511 (Laughlin) and further in view of Patent Number 5,028,824 (Young).

Claim 14 has been amended. Filed herewith is a 37 C.F.R. § 1.132 Declaration of Reddy Urimindi, an expert in the field of optical switching devices. The Declaration sets forth facts regarding the art cited by the Examiner. Applicants respectfully submit that Claims 1-14 are allowable.

Rejection Under 35 U.S.C. § 102(b)

Addressing the Examiner's rejection of Claims 14 under 35 U.S.C. § 102(b), Applicants respectfully suggest that Wayman does not anticipate the claims of the present invention. Section 2131 of the Manual of Patent Examining Procedure describes the basis for anticipation under 35 U.S.C. § 102(b). "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the . . . claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 U.S.P.Q.2d 1913, 1920 (Fed. Cir. 1989). The elements must be arranged as required by the claim. *In re Bond*, 910 F.2d 831, 15 U.S.P.Q.2d 1566 (Fed. Cir. 1990).

With respect to Claim 14, the Examiner states:

In regard to claim 14, Wayman et al discloses (see Figures 1, 3, 6) an apparatus for switching a plurality of optical paths, said apparatus comprising: a means for routing a primary optical signal (12) through an optical switch (30) as described in column 2, lines 33-47; a means for sensing (38, 40) a valid primary optical signal as described in column 3, lines 66-67 and column 4, lines 1-32; a means for routing a secondary optical signal (14) through said optical switch as described in column 2, lines 33-47; a means (50, 36) for determining when said primary optical signal has been valid for a selected period as described in column 3, lines 66-67 and column 4, lines 1-32; a means

for deselecting (50, 36) said secondary optical signal and routing said primary optical signal through said optical switch.

Paper Number 02112004, Application Serial No. 10/083,095, at 2.

Claim 14 includes means-plus-function limitations, as defined by 35 U.S.C. § 112, sixth paragraph. A means-plus-function limitation must be interpreted to cover the corresponding structure, materials, or acts in the specification and "equivalents thereof." 35 U.S.C. § 112, sixth paragraph; *see also* MPEP § 2181. The Examiner "must apply 35 U.S.C. 112, sixth paragraph in appropriate cases, and give claims their broadest reasonable interpretation, in light of and consistent with the written description of the invention in the application." MPEP 2181, pg. 2100-209, 8th ed. (emphasis added).

In accordance with MPEP § 2181, it no longer is acceptable practice for the Examiner to interpret means-plus-function limitations "as reading on any prior art means or step which performed the function specified in the claim without regard for whether the prior art means or step was equivalent to the corresponding structure, material or acts described in the specification." MPEP § 2181, pg. 2100-209 (emphasis added). "[T]he application of a prior art reference to a means or step plus function limitation requires that the prior art element perform the identical function specified in the claim." MPEP § 2182, pg. 2100-214. "However, if a prior art reference teaches identity of function to that specified in a claim, then under *Donaldson* an examiner carries the initial burden of proof for showing that the prior art structure or step is the same as or equivalent to the structure, material, or acts described in the specification which has been identified as corresponding to the claimed means or step plus function." *Id.* (emphasis added).

The MPEP states that the following factors are pertinent to "deciding whether an applicant has met the burden of proof with respect to showing nonequivalence of a prior art element that performs the claimed function." MPEP § 2184, pg. 2100-218. "First, unless an element performs the identical function specified in the claim, it cannot be an equivalent for the purposes of 35 U.S.C. 112, sixth paragraph." *Id.* Other factors that support a conclusion that the prior art element is not an equivalent includes (A) the prior art element does not perform the identical function specified in

the claim in substantially the same way, and produces substantially the same results as the corresponding element disclosed in the specification, (B) a person of ordinary skill in the art would not recognize the interchangeability of the element shown in the prior art for the corresponding element disclosed in the specification, (C) there are more than insubstantial differences between the prior art element and the corresponding element disclosed in the specification, and (D) the prior art element is not a structural equivalent of the corresponding element disclosed in the specification. *Id.* "A finding according to any of the above [factors] would represent a sufficient, but not the only possible, basis to support a conclusion that an element is or is not an equivalent. There could be other indicia that also would support the conclusion."

MPEP § 2184, pg. 2100-219.

The Specification describes the corresponding structures for the means limitations of Claim 14. The Application in Specification paragraph 19 (para. 26 in published application) provides one description of the structures corresponding to the limitation of "a means for sensing a valid primary optical signal" with respect to Figure 4:

The output of the A comparator **414A** indicates that the primary optical signal **404A** is valid, or a good signal, when the signal **408A** exceeds the setpoint **416**, and indicates that the primary optical signal **404A** is invalid, or not a good signal, when the signal **408A** does not exceed the setpoint **416**. The output of the B comparator **414B** indicates that the secondary optical signal **404B** is valid, or a good signal, when the signal **408B** exceeds the setpoint **416**.

The Application in Specification paragraph 23 (para. 30 in published application) provides another description with respect to Figure 6:

The A setpoint comparator **414A** outputs to a timing circuit **602**, which starts a timing cycle when a failed or faulted primary signal **408A** is restored or again becomes valid. The timing circuit **602** resets when the A comparator **414A** senses that the signal **408A** is below the setpoint and invalid, i.e. failed or faulted.

The Application in Specification paragraph 21 (para. 28 in published application) provides one description of the structures corresponding to the limitation of "a means for determining when said primary optical signal has been valid for a selected period" with respect to Figure 5:

the holding circuit **422** causes the optical switch **406** to switch to the B input **408B** upon failure of the A input **408A** and to maintain that path until the A input **408A** has been restored and been stable for a time determined by the RC network **C1** and **R4**.

The Application in Specification paragraph 23 (para. 30 in published application) provides another description with respect to Figure 6:

The timing circuit **602** outputs a signal to the deselect circuit **604** after a selected time passes in which the restored primary signal **408A** has been valid and stable. The deselect circuit **604** has an input from the B setpoint comparator **414B** and outputs to the output comparator **424**. In the embodiments illustrated in Figures 5 and 6, the B input to the output comparator **424** is held high after the secondary optical signal **404B** is selected, and the deselect circuit **604** pulls that input down to select the primary optical signal **404A** after the primary optical signal **404A** has been valid for a selected period.

Applicants respectfully submit that Wayman does not disclose any corresponding structures to the above-described limitations of Claim 14. The Examiner cites Wayman, column 3, lines 66-67 and column 4, lines 1-32, as describing "a means for sensing a valid primary optical signal." That portion of Wayman describes converting the optical power sense signal **68** to a digital signal with an analog to digital converter **70**. The optical power sense signal **68** also is applied to a multiplying digital to analog converter, along with a digital reference signal supplied by the processor **36**. The combined optical signal **76** is amplified and digitized by an ADC **80**. Wayman describes the sensing, or detection, of a valid primary signal as occurring within the processor **36** as it monitors the outputs of ADC **80** and **92** with respect to the stored calibration reference values. Wayman, Col. 4, lines 22-24. The structure disclosed by Wayman for "sensing a valid primary optical signal" is not equivalent to the corresponding structure for that limitation disclosed by Applicants. The digital circuit disclosed by Wayman does not (A) perform the function of sensing a valid primary optical signal in "substantially the same way" as disclosed by Applicants. See MPEP § 2184. Further, (B) "a person of ordinary skill in the art would not recognize the interchangeability" of the digital circuit for the corresponding analog elements disclosed in the Specification. *Id.* Also, (C) "there are more than insubstantial differences between" the digital circuit disclosed in Wayman and the corresponding analog elements disclosed in the Specification. *Id.* Finally, (D) the digital circuit disclosed in Wayman "is not a structural equivalent of the"

corresponding analog elements disclosed in the Specification. *Id.* Accordingly, Applicants respectfully submit that Claim 14 is not anticipated by Wayman because at least one limitation is not disclosed by Wayman.

With respect to the limitation of "a means for determining when said primary optical signal has been valid for a selected period," the Examiner cites items **50** and **36** of Wayman. Wayman describes these items as the monitor and calibration control hardware **50** and microprocessor **36**.¹ Wayman, Col. 2, lines 50-51. These items are further illustrated in Figure 3, which illustrates the conversion of the analog signals into the digital domain. Wayman, Col. 3, line 55 to Col. 4, line 32. As described in the previous paragraph, the digital circuits disclosed in Wayman are not the equivalent of the corresponding analog elements disclosed in the Specification. Accordingly, Applicants respectfully submit that Claim 14 is not anticipated by Wayman because at least one limitation is not disclosed by Wayman.

Applicants respectfully submit that Claim 14 is not anticipated by Wayman because first, the Examiner has not shown that the prior art structures are the same as those described in the Application nor has the Examiner provided an explanation and rationale describing why the prior art elements are equivalent to those described in the Application, second, Wayman does not disclose equivalent structures corresponding to those disclosed in Applicants' specification, and, therefore, Wayman does not teach each and every element of the claimed invention. Accordingly, Applicants respectfully request that the Examiner withdraw his rejection of Claim 14.

Because at least one limitation of Claim 14 does not have an equivalent disclosed in Wayman, Applications respectfully request that the Examiner withdraw his rejection to Claim 14. Additionally, Applicants have corrected a typographical omission in Claim 14 to make the claim grammatically correct. The conjunction "and" has been added before the final limitation of the claim. Applicants respectfully request the entry of this amendment.

Obviousness Under 35 U.S.C. § 103

The Examiner rejected Claims 1, 6, and 7 under 35 U.S.C. § 103(a) as being unpatentable over Wayman in view of Laughlin. The Examiner rejected Claims 2-5, 8, and 9-13 under 35 U.S.C. § 103(a) as being unpatentable over Wayman in view of

Laughlin and further in view of Young. A rejection under 35 U.S.C. § 103(a) must be supported by a *prima facie* case of obviousness. MPEP § 2142. "The examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness. If the examiner does not produce a *prima facie* case, the applicant is under no obligation to submit evidence of nonobviousness." MPEP § 2142, pg. 2100-121.

The first element in establishing a *prima facie* case of obviousness is that "there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings." MPEP § 2143. The second element is that there must be a reasonable expectation of success. *Id.* The third element is that "the prior art reference (or references when combined) must teach or suggest all the claim limitations." *Id.* "There are three possible sources for a motivation to combine references: the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art." *In re Rouffet*, 149 F.3d 1350, 1357, 47 U.S.P.Q.2d 1453, 1457-58 (Fed. Cir. 1998) (The combination of the references taught every element of the claimed invention, however without a motivation to combine, a rejection based on a *prima facie* case of obvious was held improper); see MPEP § 2143.01.

The relevant facts for finding obviousness relate to (1) the scope and content of the prior art, (2) the level of ordinary skill in the field of the invention, (3) the differences between the claimed invention and the prior art, and (4) any objective evidence of nonobviousness such as long felt need, commercial success, the failure of others, or copying. *Graham v. John Deere Co.*, 148 U.S.P.Q. 459, 467 (U.S. 1966). The obviousness analysis articulated by the United States Supreme Court in *Graham* requires that "the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved." *Id.* With respect to the fourth factor, the Supreme Court allowed that "[s]uch secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented. As indicia of obviousness or nonobviousness, these inquiries may have relevancy." *Id.*

Claims 1, 6, and 7 (and associated dependent claims)

With respect to Claims 1, 6, and 7, the Examiner states: "It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the analog selection circuit as described by Laughlin in the device of Wayman et al in order to provide for a lower cost approach for the selection circuit by using analog components." Paper Number 02112004, Application Serial No. 10/083,095, at 4.

Filed herewith is a 37 C.F.R. § 1.132 Declaration of Reddy Urimindi, an expert in the field of optical switches. The facts set forth in the declaration establish that Laughlin teaches away from using the signal monitoring circuit **28** in an optical switch using optical splitters. Declaration, para. 16.

Additionally, the Examiner asserts that "Laughlin does teach . . . that the analog selection circuit is an art-recognized equivalent of an digital selection circuit." Paper Number 02112004, Application Serial No. 10/083,095, at 4. The Examiner repeats the assertion with respect to Claim 8. *Id.*, at 7. Applicants respectfully submit that Laughlin does not contain such a teaching. Rather, Laughlin very broadly describes a signal monitoring circuit **28** without providing any structural details of the circuit or sub-circuits. Filed herewith is a 37 C.F.R. § 1.132 Declaration of Reddy Urimindi, an expert in the field of optical switches. The facts set forth in the declaration establish that "one skilled in the art would not recognize an analog selection circuit as an art-recognized equivalent of an digital selection circuit." Declaration, para. 15.

Applicants respectfully submit that Claims 1, 6, and 7 are not unpatentable over Wayman in view of Laughlin because, first, Laughlin teaches away from modifying the device of Waymans as suggested by the Examiner; second, there is no suggestion or motivation to modify the device of Waymans as suggested by the Examiner, which is the first requirement of a *prima facie* case of obviousness; and, third, Applicants have submitted evidence refuting the Examiner's claims of obviousness and the Examiner has not presented any contradicting evidence. Accordingly, Applicants respectfully request that the Examiner withdraw his rejection of Claims 1, 6, and 7. Further, Applicants respectfully submit that Claims 2 to 5 are also in condition for allowance as depending from allowable base claims.

Claim 7

Notwithstanding that Claim 7 is allowable as depending from an allowable base claim, Applicants respectfully submit that Laughlin does not anticipate Claim 7 because Claim 7 includes limitations not disclosed by Laughlin. Claim 7 includes means-plus-function limitations, as defined by 35 U.S.C. § 112, sixth paragraph. As required by MPEP § 2181, the Examiner has not shown "that the prior art structure or step is the same as or equivalent to the structure, material, or acts described in the specification." Also, the Examiner has not provided "an explanation and rationale in the Office action as to why the prior art element is an equivalent."

Claim 7 includes limitations for "a means for routing said secondary optical signal after said primary optical signal becomes invalid; a means for determining whether said primary optical signal has been valid for a selected period; and a means for deselecting said secondary optical signal and routing said primary optical signal through said optical switch." The Specification describes the corresponding structures for the means limitations of Claim 7.

The Application in Specification paragraph 23 (para. 30 in published application) provides one description of the structures corresponding to the limitation of "a means for determining whether said primary optical signal has been valid for a selected period" with respect to Figure 6:

The A setpoint comparator **414A** outputs to a timing circuit **602**, which starts a timing cycle when a failed or faulted primary signal **408A** is restored or again becomes valid. The timing circuit **602** resets when the A comparator **414A** senses that the signal **408A** is below the setpoint and invalid, i.e. failed or faulted.

The Application in Specification paragraph 21 (para. 28 in published application) provides one description of the structures corresponding to the limitation of "a means for deselecting said secondary optical signal and routing said primary optical signal through said optical switch" with respect to Figure 5:

the holding circuit **422** causes the optical switch **406** to switch to the B input **408B** upon failure of the A input **408A** and to maintain that path until the A input **408A** has been restored and been stable for a time determined by the RC network **C1** and **R4**.

The Application in Specification paragraph 23 (para. 30 in published application) provides another description with respect to Figure 6:

The timing circuit **602** outputs a signal to the deselect circuit **604** after a selected time passes in which the restored primary signal **408A** has been valid and stable. The deselect circuit **604** has an input from the B setpoint comparator **414B** and outputs to the output comparator **424**. In the embodiments illustrated in Figures 5 and 6, the B input to the output comparator **424** is held high after the secondary optical signal **404B** is selected, and the deselect circuit **604** pulls that input down to select the primary optical signal **404A** after the primary optical signal **404A** has been valid for a selected period.

Filed herewith is a 37 C.F.R. § 1.132 Declaration of Reddy Urimindi, an expert in the field of optical switches. The facts set forth in the declaration establish that Laughlin does not disclose a timing circuit connected to a deselect circuit in a manner as asserted by the Examiner. Declaration, para. 18.

Applicants respectfully submit that Claim 7 is not unpatentable over Wayman in view of Laughlin because first, the Examiner has not shown that the prior art structures are the same as those described in the Application nor has the Examiner provided an explanation and rationale describing why the prior art elements are equivalent to those described in the Application, second, Laughlin does not disclose equivalent structures corresponding to those disclosed in Applicants' specification, and, therefore, Laughlin does not teach each and every element of the claimed invention, and third, Applicants have submitted evidence refuting the Examiner's claims of obviousness and the Examiner has not presented any contradicting evidence. Accordingly, Applicants respectfully request that the Examiner withdraw his rejection of Claim 7.

Claims 2 to 5, 8 to 10, and 12 to 13

With respect to Claims 2 to 5, 8 to 10, and 12 to 13, the Examiner repeats his assertion that "[i]t would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the timing and deselect circuits as taught by Young in the device of Wayman et al in view of Laughlin." The Examiner asserts repeatedly that Young teaches an analog selection circuit that includes a timing circuit and a deselect circuit.

Filed herewith is a 37 C.F.R. § 1.132 Declaration of Reddy Urimindi, an expert in the field of optical switches. The facts set forth in the declaration establish the following:

"Young teaches a delay circuit for digital systems and does not teach an analog selection circuit." Declaration, para. 30.

"Young does not teach an analog selection circuit having a timing circuit and a selection circuit that is adaptable for switching an optical signal." Declaration, para. 31.

"Contrary to the assertion of the Examiner quoted in Paragraph 20 that '[i]t would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the timing and deselect circuits as taught by Young in the device of Wayman et al in view of Laughlin,' it was not obvious to one having ordinary skill in the art at the time of filing of Application Serial Number 10/083,095 to use the delay circuit taught by Young as an analog selection circuit." Declaration, para. 32.

Applicants respectfully point out that Young discloses a digital delay circuit, whereas the claim limitations specify an analog selection circuit. It is not appropriate to use Young as a reference because the disclosure in Young is unrelated to Applicants' invention. Accordingly, modifying the switch of Waymans to use an analog selection circuit having the delay circuit of Young was not obvious to one skilled in the art at the time of filing of the Application.

Notwithstanding that Claims 2 to 5 are allowable as depending from an allowable base claim, Applicants respectfully submit that Claims 2 to 5, 8 to 10, and 12 to 13 are not unpatentable over Wayman in view of Laughlin and further in view of Young because first, there is no suggestion or motivation to modify the device of Waymans as suggested by the Examiner, which is the first requirement of a *prima facie* case of obviousness; second, the prior art references do not teach all the elements and limitations of the claims as suggested by the Examiner, which is the third requirement of a *prima facie* case of obviousness; and, third, Applicants have submitted evidence refuting the Examiner's claims of obviousness and the Examiner has not presented any contradicting evidence. Accordingly, Applicants respectfully request that the Examiner withdraw his rejection to Claims 2 to 5, 8 to 10, and 12 to 13.

Amendments to Claims 8 and 14

Claim 8 has been amended to delete the limitation that "said deselect circuit including a Schmitt trigger and a diode." Applicants respectfully submit that Claim 8 is novel and non-obvious without such limitation, as shown by the prior art cited by the Examiner. Claim 14 has been amended to correct a typographical omission in Claim 14. The conjunction "and" has been added before the final limitation of the claim. Applicants respectfully request the entry of these amendments.

Conclusion

In view of the amendment of Claim 14, it is believed that the above-identified patent application is in a condition for the issuance of a Notice of Allowance. Such action by the Examiner is respectfully requested. If, however, the Examiner is of the opinion that any of the drawings or other portions of the application are still not allowable, it will be appreciated if the Examiner will telephone the undersigned to expedite the prosecution of the application.

Please charge any additional fees associated with this communication, or credit any overpayment, to Deposit Account No. 16-1910 (26308.01).

Respectfully submitted,



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